

CLAIMS

1. Closing device for doors, hoods, or hatches, especially of motor vehicles,

-- with a grip flap (12), pivotably supported (11) in a grip housing (10), which flap is held by a restoring force (38) in a rest position (12.1) in the housing (10) and is manually actuated (37) to move it into its working position (12.2), and

-- with an electric switch (20), which has a contact actuator and a switch spring (27),

-- the contact actuator (24) is held by the spring-loading (28) of the switch spring in a starting position (24.1), in which the switch (20) is in a first contact position; and

-- upon actuation (37) of the flap (12), the contact actuator (24) is moved against the spring-loading (28) of its switch spring (27) into an actuating position (24.2), in which the switch (20) is in its second contact position, characterized in that

-- the restoring force (38) for the grip flap (12) is produced by the switch spring (27) of the electric switch; in that

-- a stop (43), which limits the actuating travel (37) of

the grip flap (12) in the direction toward its working position (12.2), is provided on the grip housing (10); in that

-- an elastic element (48) is provided between the contact actuator (24) and the grip flap (12); and in that

-- when the actuated grip flap (12) is in contact with the stop (30), the elastic element (48) is elastically deformed to such an extent, and thus the actuating force (45) of the grip flap (12) arriving at the electric switch (20) is reduced to such an extent, that the maximum force allowed for actuating the switch (12) is not exceeded.

2. Closing device according to Claim 1, characterized in that the elastic element (48) consists of a spring element.

3. Closing device according to Claim 1, characterized in that the elastic element (48) is formed by the contact actuator (24) of the electric switch (12) itself.

4. Closing device according to one of Claims 1-3, characterized in that the contact actuator (24) consists of a plunger, which is spring-loaded (28) by the switch spring (27) in the longitudinal direction.

5. Closing device according to Claim 4, characterized in that the plunger points toward the bottom surface (13) of the grip flap (12).

6. Closing device according to Claim 4 or Claim 5, characterized in that the plunger consists of elastomeric material and also takes over the function of the elastic element (48) during the transmission of the actuating force (45), and in that the plunger assumes a convex shape (49) when the elastic element is deformed.

7. Closing device according to one or more of Claims 1-6, characterized in that the electric switch (20) is located on the outside of the grip housing (10), and in that the contact actuator (24) acts directly on the grip flap (12).

8. Closing device according to one or more of Claims 1-7, characterized in that the electric switch (20) is located in the interior of the grip housing (10), and in that the contact actuator (24) acts (19) directly on the grip flap (12).

9. Closing device according to one of Claims 1-8, characterized in that the switch spring (27) of the plunger (24) consists of a curved diaphragm spring, which is attached around its periphery to the switch housing (23); in that, in the starting position (24.1), the curvature of the diaphragm (27) is directed away from the stationary contacts (21, 22); and in that, in the actuating position (24.2), the curvature of the diaphragm (27) is directed toward the contacts (21, 22).

10. Device according to Claim 9, characterized in that, to increase the restoring force (38) acting on the grip flap (12), the diaphragm spring (27) can be designed to consist of several layers.

11. Closing device according to one of Claims 1-10, characterized in that the grip housing (10) has an opening (15), through which an electric cable (40) can pass, the conductors (41, 42) of which proceed into the switch housing (23), where they are connected to the electric contacts (21, 22).

12. Closing device according to one of Claims 1-11, characterized in that the grip housing (10) consists of a shell, which is open toward the bottom surface (13) of the grip flap (12), in which shell the switch housing (23) and possibly a mounting aid (30) are provided.

13. Closing device according to one of Claims 1-12, characterized in that the electric switch (20) is held in place in a mounting shell (30), and in that, when the mounting shell (30) is installed, it latches into position in the grip housing (10).

14. Closing device according to one of Claims 1-13, characterized in that an elevation, which serves as a stop (43) for the grip flap (12), is provided on the mounting shell (30)

or on the housing (10).

15. Closing device according to Claim 13 or Claim 14 with a strain-relief device for the electric cable (40) assigned to the electric switch (20), characterized in that the strain-relief device (31, 32) is integrated into the mounting shell (30).

16. Closing device according to Claim 15, characterized in that the strain-relief device (31, 32) consists of a labyrinthine guide for the electrical conductors (41, 42), which guide is an integral part of the mounting shell (30).

17. Closing device according to Claim 16, characterized in that the strain-relief device consists of two pins (31, 32) seated in the interior (33) of the shell, around which the electrical conductors (41, 42) of the cable (40) pass in the form of an "S".

18. Closing device according to one of Claims 13-17, characterized in that the mounting shell (30) is filled with a casting compound, which at least partially covers the electric switch (20) and/or the electrical conductors (21, 22).

19. Closing device according to Claim 18, characterized in that the casting compound serves to hold the switch housing (23) permanently in position in the mounting shell (30).

20. Closing device according to one of Claims 1-19, characterized in that the mounting shell (30), the switch (20) mounted in it together with the restoring force (38) acting on the grip flap (12), and the cable (40) seated in the strain-relief device (31, 32) form a structural unit (44) which can be preassembled, and in that the structural unit (44) can first be assembled, then inserted (34) into the housing (10), and finally fixed in place therein (10).